Course Programme MVE172 Basic Stochastic Processes and Financial Applications, 7.5 credits, 2nd quarter Fall 2020

Responsible teacher. Patrik Albin, email palbin@chalmers.se

Financial teacher. Simone Calogero, email calogero@chalmers.se

Teaching assistant/exercise teacher. Petar Jovanovski, email petarj@chalmers.se

Course web-page. https://chalmers.instructure.com/courses/11080

Responsible university unit. Mathematical Sciences, Chalmers Tvärgata 3.

Literature. *Hwei Hsu: Probability, Random Variables, and Random Processes, 2nd Ed. 2010 or 3rd Ed. 2014. Schaum's Outlines, McGraw-Hill* is available from Cremona Chalmer's bookshop. List of Errata for Hsu's book is available from the course web-page. Crasch course hand-out (stencil) on probability theory and math available from the course web-page. Information about exercises on Hsu's book are available from the course web-page. Financial lecture notes authored by Simone Calogero available from course web-page and a finacial project in Matlab distributed by Simone Calogero during financial part of course.

Contents of course. Chapter 5, Sections 6.1-6.3B and Chapter 9 in Hsu's book. Financial literature as listed above.

Lectures 1'st half of course about random processes are digital/remote due to covid-19 pandemic. They are available at the course homepage as pdf-files as well as prerecorded live shows with Patrik. Their total number 14 double hours is how many double hour classroom lectures the covered material corresponds to. The tempo of the course is indicated below. All material for an upcoming week will be available at the course homepage at latest Wednesday that week.

Lectures	**Week**	**Programme**
Lectures 1-2	1	Crash course
Lectures 3-4	1	Sections 5.1-5.4 in Hsu
Lectures 5-7	2	Section 5.5 in Hsu
Lecture 8	2	Sections 5.6-5.7 in Hsu
Lectures 9-11	3	Section 5.8 in Hsu
Lecture 12	3	Sections 6.1-6.3B in Hsu
Lectures 13-14	4	Chapter 9 in Hsu

The second half of the course about financial applications will be a reading project course. More information will follow.

Exercises. The exercise material for the first half of the course is available from the course web-page.

The problems for own work in Hsu's book are discussed during the exercise sessions. The computer problems for own work have solutions on the course web page and can be discussed with Patrik during his consultation meetings.

There is a scheduled weekly digital/remote exercise session during course weeks 2-5 where the problems for own work in Exercise Sessions 1-4 are solved.

Students are supposed to study solved problems first. Thereafter, ideally, students shall try to work with the problems for own work themselves before going to the exercise sessions and seeing the solutions.

Zoom consultation meetings on lectures. Wednesday 3.15 PM weeks 2-4.

Zoom consultation meetings on exercises. Thursday 10 AM weeks 2-4 and time to be determined week 5.

Examination. Written home exam (4,5 credits) on first half of course three hours Saturday 5 December 2020 with reexams April 2021 and August 2021. On the December exam all aids are

permitted.

Financial Matlab project (3 credits) that is reported to Simone Calogero at the end of the course. There will be additional opportunities to report the project (if not passed before) in connection with the written re-exams.

Permitted aids on campus exams are either two A4-sheets (4 pages) of hand-written notes (xerox-copies and computer print-outs are not allowed) or Beta – but not both these aids. All aids are permitted on home exams.

Written exams have 4 tasks with a total 20 possible points - you need 8 points for grade 3, 12 points for grade 4 and 16 points for grade 5.

The financial project only have grades pass and failure and when a pass has been recived on both the written exam and the project it is the written exam that determines the final grade on the course.

Language. All teaching and literature on course is in English.